Claims

1. A method for reducing the power consumption of a mobile station (2) connected to a packet-switched network (4), in which packet-switched network information is transmitted in the form of data frames, and in which method a paging period is specified for a mobile station for sending paging messages (UD1) essentially at the intervals of said paging period to the mobile station, the mobile station (2) is set in the standby mode at least for the time of the reception of paging messages (UD1), and after the reception of the paging message (UD1), the mobile station, which is in the standby mode, is set to the idle mode, in which idle mode part of the functions of the mobile station (2) are set in the power saving mode or switched off, **characterized** in that the mode of operation of a mobile station in the idle mode is changed from the idle mode to the standby mode to receive information transmitted in the packet-switched network either at intervals during the paging period for maintaining synchronization to the packet-switched network, or at the end of the paging period for performing the synchronization to the packet-switched network again.

2. A method according to Claim 1, **characterized** in that at least two different paging periods are defined, and that the selection of the paging period for the idle mode is performed in the mobile station.

3. A method according to Claim 2, **characterized** in that the selection of the paging period is based on received signal strength.

4. A method according to Claim 3, **characterized** in that the selection of the paging period is based on running average of the received signal strength.

5. A method according to Claim 3 or 4, **characterized** in that the method comprises at least the following steps:

- a first threshold value (X) is defined,
- a maximum paging period and a minimum paging period are defined,
- a representation of the received signal is calculated by using the received signal strength,
- said representation of the received signal is compared with at least one previously calculated representation of the received signal,

- if the comparison indicates that the difference between the representation of the received signal and all the previously calculated representations of the received signal lies within said first threshold value, the paging period is increased if current paging period is shorter than said maximum paging period,
- if the comparison indicates that the difference between the representation of the received signal and any of the previously calculated representations of the received signal is greater than said first threshold value, the paging period is decreased if current paging period is longer than said minimum paging period.

6. A method according to Claim 2, **characterized** in that the selection of the paging period is defined by the user of the mobile terminal.

7. A method according to any of the Claims 1 to 6, **characterized** in that in the idle mode the timing functions of the mobile station are controlled with a first oscillator (O1), whereby the time for changing from the idle mode to the standby mode is specified at least partly on the basis of the frequency stability of the first oscillator (O1).

8. A method according to Claim 7, **characterized** in that the method includes at least the following steps:
a synchronization period is specified for the mobile station (2) on the basis of the frequency stability of the first oscillator (O1),
a paging message (UD1) is received,
the mobile station (2) is set in the idle mode,
the time of reception of the next paging message is specified,
the specified synchronization period is compared with the specified time of reception,
if the synchronization period is at least as long as the time before the next time of reception of a paging message, the idle mode is set to end essentially immediately before the time of reception of the next paging message,
if the synchronization period is shorter than the time before the time of reception of the next paging message, the idle mode is set to end before the specified synchronization time has expired, whereby synchronization is performed, and the steps c) to g) are repeated, and

at least the steps b) to h) are repeated in connection with the reception of each paging message.

9. A method according to Claim 8, **characterized** in that the data frame is formed of bursts, and that multiframes of a certain length are formed of the data frames, whereby the synchronization period is specified as a number of multiframes.

10. A method according to Claim 9, **characterized** in that the multiframe is formed of 52 data frames, that the paging period is specified as 64 multiframes, and that the synchronization period is specified as nine multiframes.

11. A method according to Claim 9 or 10, **characterized** in that synchronization bursts are sent in data frames, whereby resynchronization is performed by receiving said synchronization bursts.

12. A method according to any one of the Claims 1 to 11, **characterized** in that the packet-switched network is a GPRS packet-switched network.

13. A system, which comprises:
a packet-switched network (4),
at least one mobile station (2) having a data transfer connection with the packet-switched network (4),
means (BSS, 38) for sending information in the form of data frames between the mobile station (2) and the packet-switched network (PLMN1, PLMN2),
means (2) for specifying the paging period, whereby paging messages (UD1) are arranged to be sent essentially at the intervals of said paging period to the mobile station (2),
means (32) for setting the mobile station (2) to the standby mode at least for the time of the reception of the paging messages (UD1),
means (32) for setting the mobile station, which is in the standby mode, to the idle mode after the reception of the paging message (UD1), and
means (25) for setting some of the functions of a mobile station (2) to the power saving mode or for switching them off in the idle mode,
characterized in that the system also comprises means (T1) for changing the mode of operation of a mobile station, which is in the idle mode, from the idle mode to the standby mode to receive information transmitted in the

packet-switched network either at intervals during the paging period for maintaining synchronization to the packet-switched network, or at the end of the paging period for performing synchronization to the packet-switched network again.

14. A system according to Claim 13, **characterized** in that the mobile station comprises a first oscillator (O1) for controlling the timing functions of the mobile station in the idle mode, whereby the time for changing from the idle mode to the standby mode is specified at least partly on the basis of the frequency stability of the first oscillator (O1).

15. A system according to Claim 14, **characterized** in that the mobile station (2) also comprises:
means for specifying the synchronization period on the basis of the frequency stability of the first oscillator (O1),
means (38) for receiving a paging message (UD1),
means (32) for setting the mobile station (2) to the idle mode,
means (32) for specifying the time of reception of the next paging message,
comparison means (32) for comparing the specified synchronization period with the specified time of reception,
means (32) for setting the ending time of the idle mode on the basis of the comparison carried out with said comparison means, whereby
if the synchronization period is at least as long as the time before the next time of reception of a paging message, the idle mode has been set to end essentially immediately before the time of reception of the next paging message,
if the synchronization period is shorter than the time before the time of reception of the next paging message, the idle mode has been set to end before the specified synchronization time has expired, whereby synchronization is arranged to be performed, and the mobile station to be set to the idle mode after synchronization.

16. A method according to Claim 15, **characterized** in that the data frame has been formed of bursts, and that multiframes of a certain length have been formed of the data frames, whereby the synchronization period is arranged to be specified as a number of multiframes.

17. A method according to Claim 16, **characterized** in that the multiframe has been formed of 52 data frames, that the paging period has been specified as 64 multiframes, and that the synchronization period has been specified as nine multiframes.

18. A method according to Claim 15 or 16, **characterized** in that synchronization bursts are arranged to be sent in data frames, whereby resynchronization is arranged to be performed by receiving said synchronization bursts.

19. A system according to any one of the Claims 13 to 18, **characterized** in that the packet-switched network is a GPRS packet-switched network.

20. A mobile station (2), which comprises:
means (38) for establishing a data transfer connection to the packet-switched network (4),
means (32) for specifying the paging period, whereby paging messages (UD1) are arranged to be sent essentially at the intervals of said paging period to the mobile station (2),
means (32) for setting the mobile station (2) to the standby mode at least for the time of the reception of the paging messages (UD1),
means (32) for setting the mobile station, which is in the standby mode, to the idle mode after the reception of the paging message (UD1), and
means (25) for setting some of the functions of a mobile station (2) to the power saving mode or for switching them off in the idle mode,
characterized in that the system also comprises means (T1) for changing the mode of operation of a mobile station, which is in the idle mode, from the idle mode to the standby mode to receive information transmitted in the packet-switched network either at intervals during the paging period for maintaining synchronization to the packet-switched network, or at the end of the paging period for performing synchronization to the packet-switched network again.